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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/636,087	08/06/2003	Thomas C. Savell	6407P239	9834

21186 7590 04/05/2007
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EXAMINER

SAUNDERS JR, JOSEPH

ART UNIT	PAPER NUMBER
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2615

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/636,087	Applicant(s) SAVELL, THOMAS C.	
	Examiner Joseph Saunders	Art Unit 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED, (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-69 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-69 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This is the initial office action based on the application filed on September 14, 2005. Claims 1 – 69 are currently pending and considered below.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 – 18 and 20 – 69 are rejected under 35 U.S.C. 102(e) as being anticipated by Borland et al. (US 6,724,772 B1), hereinafter Borland.

Claim 1: Borland discloses a digital processing integrated circuit to process media data (integrated circuit 100 data transfers may be voice, audio, and/or video, Column 5 Lines 43 – 45 and Figures 1 – 3), the integrated circuit including: a plurality of processing modules to process the media data (modules 210A – 210H); a data path to communicate data between the processing modules, wherein the data path is arranged within the integrated circuit in a ring configuration (two circular buses, 330 and 332); and a digital interface to communication with a device external to the integrated circuit

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(module 210 may be an I/O controller communicating with a computer system) (Column 1 Lines 5 – 35, Column 3 Line 64 – Column 4 Line 12).

Claim 2: Borland discloses the integrated circuit of claim 1, wherein the data path defines a media data path including a digital audio bus that serially interconnects the plurality of processing modules ("Buses 330 and 332 may be serial or parallel buses, as desired," Column 6 Lines 24 – 36).

Claim 3: Borland discloses the integrated circuit of claim 2, wherein the digital audio bus communicates digital audio data in a plurality of time-slots ("The bus controller 350 may enable data transfers on the TDMA bus 330 only during assigned time slots of assigned frequency and assigned length," Column 5 Lines 55 – 59), each particular processing module having at least one programmable or fixed time-slot from which data is received from the data path for processing by the particular processing module ("The schedule includes information on time slot assignments for one or more of the plurality of modules," Column 6 Lines 6 – 11).

Claim 4: Borland discloses the integrated circuit of claim 2, wherein the digital audio bus communicates digital audio data in a plurality of time-slots, each particular processing module being assigned at least one time-slot into which data processed by the particular processing module is exported to the digital audio bus ("If the timing indicates real-time or fast response, then the bus controller 350 may assign multiple

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contiguous time slots to the data transfer associated with that request. Time slots may be set with any frequency and/or length, as desired," Column 6 Lines 1 – 5).

Claim 5: Borland discloses the integrated circuit of claim 3, wherein one of the processing modules is a Digital Signal Processor (DSP) (bus controller 350) and the data path communicates processing control data in a plurality of time-slots that are allocated to the processing modules under control of the DSP ("the bus controller 350 includes, or has direct access to, a memory 315, which stores a schedule of the data transfers." "The bus controller examines the schedule when a new request is received and allocated unused time slots for the new request," Column 6 Lines 6 – 24).

Claim 6: Borland discloses the integrated circuit of claim 1, wherein the data path is a time division multiplexed bus ("bus 330 is a time division, multiple access (TDMA) bus", Column 5 Lines 55 – 59) including a plurality of audio channels (time slots for audio data).

Claim 7: Borland discloses the integrated circuit of claim 1, wherein the data path communicates data between the plurality of processing modules at bit rates that differ ("If the timing indicates real-time or fast response, then the bus controller 350 may assign multiple contiguous time slots to the data transfer associated with that request. Time slots may be set with any frequency and/or length, as desired," Column 6 Lines 1 – 5).

Claim 8: Borland discloses the integrated circuit of claim 7, wherein the media data path includes a total number of time-slots for communicating media data at a plurality of different bit rates, and wherein the sum of a number of time-slots allocated to each one of the plurality of bit rates equals the total number of time-slots summed across every bit rate ("If the timing indicates real-time or fast response, then the bus controller 350 may assign multiple contiguous time slots to the data transfer associated with that request. Time slots may be set with any frequency and/or length, as desired," Column 6 Lines 1 – 5. Therefore, the sum of a number of time-slots allocated to each one of the plurality of bit rates equals the total number of time-slots summed across every bit rate).

Claim 9: Borland discloses the integrated circuit of claim 1, wherein each processing module: selectively extracts media data for processing from the data path, the media data being provided in at least one time-slot of the data path allocated to the processing module; selectively inserts processed media data into its allocated time-slot; and passes media data that it receives and that is associated with other processing modules unchanged along the data path (Data is passed from module to module in a manner controlled by the bus controller and task specific or task general processing takes place at each module, Column 4 Lines 1 – 5, Column 6 Lines 24 – 35).

Claim 10: Borland discloses the integrated circuit of claim 1, wherein the number of processing modules connected along the data path is configurable, each processing

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module included in the device being allocated at least one time-slot provided by the data path (Borland discloses that the integrated circuit 100 contains “a plurality of modules 210,” Column 5 Lines 14 – 19, and therefore allows for the number of modules to be configurable).

Claim 11: Borland discloses the integrated circuit of claim 1, wherein the data path includes a control data path (“integrated circuit 100 includes a unified data, address, and control bus 330, or a separate data bus 330 and control bus 332,” Column 6 Lines 24 – 36) to communicate processing control data (transfer requests) to at least one processing module, the processing control data being used by the processing module to process digital data received from the data path (Transfer requests provide identifier information, transfer size, and timing information necessary for the processing module to process the digital data received from the data path, Column 5 Lines 24 – 36).

Claim 12: Borland discloses the integrated circuit of claim 11, wherein the processing control data includes parameters for digital signal processing by the processing module (Transfer requests provide identifier information, transfer size, and timing information necessary for the processing module to process the digital data received from the data path, Column 5 Lines 24 – 36).

Claim 13: Borland discloses the integrated circuit of claim 12, wherein the parameters include at least one of filter parameters, time delay parameters (“The bus controller

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examines the priority value and the timing value when the bus controller analyzes the request for transfer,” enabling for example previously scheduled requests to be reassigned or delayed to later time slots, as necessary, Column 6 Lines 6 – 23. This information is provided in the transfer requests or control data.), mixing parameters, and sample-rate conversion parameters.

Claim 14: Borland discloses the integrated circuit of claim 11, wherein the processing control path (“integrated circuit 100 includes a unified data, address, and control bus 330, or a separate data bus 330 and control bus 332,” Column 6 Lines 24 – 36) is a time division multiplexed bus arranged in a ring configuration (Figures 2 and 3).

Claim 15: Borland discloses the integrated circuit of claim 11, wherein the processing control data includes streams of processing control data each of which is associated with a stream of media data communicated via the data path, each stream of processing control data being destined for an associated target processing module to which the stream of media data is communicated (“Streams” of data are communicated in time slots on buses 330 and 332 and the buses may be serial or parallel, the control data is associated with the media data and tells the associated target processing module how to process the media data, Column 1 Line 39 – Column 2 Line 44).

Claim 16: Borland discloses the integrated circuit of claim 15, wherein each stream of processing control data is arranged to be communicated via the control data path to

arrive at its associated target processing module prior to a source processing module exporting the media data to the media data path ("bus controller examines the priority value and the timing value when the bus controller analyzes the request for the transfer," Column 6 Lines 21 – 23).

Claim 17: Borland discloses the integrated circuit of claim 1, wherein the data path includes: a plurality of media channels (time slots for audio data) defined by time division multiplexed time-slots; and a channel identification path (address bus) including channel identification data ("an identifier which identifies one or more receiving modules 210," Column 5 Lines 24 – 29) to identify each media channel to the processing modules (Column 6 Lines 24 – 26).

Claim 18: Borland discloses the integrated circuit claim 17, wherein the data path includes a control data path (control bus) to communicate processing control data to at least one processing module (modules 210), the control data path including a plurality of control channels (time slots) defined by time division multiplexed time-slots, wherein the channel identification path identifies both the media channels and the control channels (address bus includes identification information of the individual time slots corresponding to both the control and data buses) (Column 6 Lines 24 – 36).

Claim 20: Borland discloses the integrated circuit of claim 1, wherein the processing modules are digital audio processing modules selected from the group consisting of an

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audio memory transport module, a digital delay line module, a sample rate converter module, a filter module, a mixer module, a DSP module, and a digital Input/Output module (I/O controller, Column 4 Lines 1 – 4).

Claim 21: Borland discloses the integrated circuit of claim 1, wherein the integrated circuit is in a very large scale integration (VLSI) device (The integrated circuit 100 is a system-on-a-chip and therefore a VLSI device, Column 1 Lines 5 – 35).

Claim 22: Borland discloses a digital processing integrated circuit to process media data (integrated circuit 100 data transfers may be voice, audio, and/or video, Column 5 Lines 43 – 45 and Figures 1 – 3), the integrated circuit including: a plurality of processing modules to process the media data (modules 210A – 210H); a media data path to communicate the media data between the processing modules; a processing control data path to communicate processing control data between the plurality of processing modules (two circular buses, 330 and 332), wherein the processing control data (transfer requests) defines processing functionality at an associated processing module (Transfer requests provide identifier information, transfer size, and timing information necessary for the processing module to process the digital data received from the data path, Column 5 Lines 24 – 36.); the integrated circuit including a routing controller (bus controller 350) to route the media data and the processing control data along the data path to an associated processing module; and a digital interface to communicate media data with a device external to the integrated circuit (module 210

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may be an I/O controller communicating with a computer system) (Column 1 Lines 5 – 35, Column 3 Line 64 – Column 4 Line 12).

Claim 23: Borland discloses the integrated circuit of claim 22, wherein the media data path and the processing control path are arranged in a ring configuration (two circular buses, 330 and 332, Figures 2 and 3).

Claim 24: Borland discloses a method to process media data in communicate media data a plurality of processing modules in a digital media processing integrated circuit (integrated circuit 100 data transfers may be voice, audio, and/or video, Column 5 Lines 43 – 45 and Figures 1 – 3), the method including: communicating, within the integrated circuit (communicating via circular buses 330 and 332, Figures 2 and 3), providing the media data from processing module to processing module along a data path interconnecting the plurality of processing modules (transfer requests) until media data from a source processing module is received; extracting the media data at a target processing module of the plurality of processing modules (Since the modules are serially connected the modules and the bus is a TDMA bus, data is passed through all modules however is only processed at the appropriate destination module, Column 1 Line 39 – Column 2 Line 44); and communicating media data between the data path and a device external to the integrated circuit (module 210 may be an I/O controller communicating with a computer system) (Column 1 Lines 5 – 35, Column 3 Line 64 – Column 4 Line 12).

Claim 25: Borland discloses the method of claim 24, which includes communicating the media data sequentially between the plurality of processing modules ("Buses 330 and 332 may be serial or parallel buses, as desired," Column 6 Lines 24 – 36).

Claim 26: Borland discloses the method of claim 24, wherein the data path includes a processing module identifier ("an identifier which identifies one or more receiving modules 210," Column 5 Lines 24 – 29) that identifies the source processing module that provides the media to the data path (each module has an assigned time slot to communicate information, Column 5 Lines 55 – 59).

Claim 27: Borland discloses the method of claim 24, which includes passing on media data received at a particular processing module to another processing module when the processing module receiving the media data is not the target processing module (Since the modules are serially connected the modules and the bus is a TDMA bus, data is passed through all modules however is only processed at the appropriate destination module, Column 1 Line 39 – Column 2 Line 44).

Claim 28: Borland discloses the method of claim 24, wherein the data path includes a plurality of time-slots (TDMA bus), the method including providing the processed media data into a time-slot associated with a source processing module (each module has an assigned time slot to communicate information, Column 5 Lines 55 – 59).

Claim 29: Borland discloses the method of claim 24, wherein the data path includes a digital media path and a processing control path (buses 330 and 332), the method including: providing the media data in the form of audio data ("voice, audio and/or video transfers," Column 5 Lines 44 – 45) to the digital media path; and providing processing control data to the processing control data path, the processing control data controlling the processing of the audio data by the target processing module (Transfer requests provide identifier information, transfer size, and timing information necessary for the processing module to process the digital data received from the data path, Column 5 Lines 24 – 36).

Claims 30 – 35: Claims 30 – 35 are substantially similar in scope to claims 3 – 8 and therefore are rejected for the same reasons.

Claims 36 – 46: Claims 36 – 46 are substantially similar in scope to claims 10 – 20 and therefore are rejected for the same reasons.

Claims 47 – 69: Claims 47 – 69 are substantially similar in scope to claims 24 – 46 and therefore are rejected for the same reasons.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Borland et al. (US 6,724,772 B1).

Claim 19: Borland discloses the integrated circuit of claim 1, but *does not disclose* wherein the data path includes a transport bus to communicate data between an external memory that is separate from the integrated circuit and at least one of the plurality of processing modules of the integrated circuit. Borland does disclose that one of the processing modules 210 is an I/O controller (Column 4 Line 2) and that the integrated circuit processes audio data (Column 6 Line 44). Borland also discloses that computer systems comprise a motherboard, microprocessor, memory, and busses, and also a plurality of computer chips. Borland then discloses that the integrated circuit simplifies the amount of computer chips necessary by combining the components into a single integrated circuit, which results in a system-on-a-chip (SOC) (Column 1 Lines 5 – 35). Therefore, since the system-on-a-chip is within a computer system and the SOC is responsible for processing media data it would have been obvious to one of ordinary skill in the art at the time of the invention to use the I/O controller of the integrated circuit and the buses located within the computer system to transfer media data from a

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memory, which commonly holds media data within a computer system, on the bus within the computer system to the I/O of the integrated circuit, so that the integrated circuit can have a source of media to process.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Saunders whose telephone number is (571) 270-1063. The examiner can normally be reached on Monday - Thursday, 9:00 a.m. - 4:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



JS
March 22, 2007



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Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :4-13-04, 4-23-04, 4-11-05, 8-18-05, 11-9-05, 11-16-05, and 3-8-07.